

WHAT IS CLAIMED IS:

1. An OSI tunnel routing method in which  
an IP packet which is encapsulated in an OSI packet  
5 is transmitted between transmission apparatuses each  
connected to an IP network in which said  
transmission apparatuses form an OSI network, said  
method comprising the steps of:

10 said transmission apparatuses exchanging  
reachable IP network addresses and each own OSI  
network address on said OSI network;

15 each of said transmission apparatuses  
generating an OSI tunnel table which includes OSI  
network addresses of said transmission apparatuses  
and said reachable IP network addresses; and

20 a first transmission apparatus in said  
transmission apparatuses which receives an request  
to access an IP address determining a second  
transmission apparatus which can transfer data for  
said IP address by referring to said OSI tunnel  
table, and generating an OSI tunnel between said  
first transmission apparatus and said second  
transmission apparatus.

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2. The OSI tunnel routing method as  
claimed in claim 1, further comprising the step of:  
30 deleting said OSI tunnel when said OSI  
tunnel is not used for a predetermined time.

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3. The OSI tunnel routing method as  
claimed in claim 1, further comprising the step of:

generating a new OSI tunnel by using an alternate route and switching said OSI tunnel to said new OSI tunnel when a failure occurs in a route of said OSI tunnel.

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4. The OSI tunnel routing method as claimed in claim 3, further comprising the step of:  
switching said new OSI tunnel back to said OSI tunnel when said route recovers from said failure within a predetermined time.

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5. The OSI tunnel routing method as claimed in claim 1, further comprising the step of:  
a third transmission apparatus in said transmission apparatuses receiving an address resolution request, and sending a MAC address of said third transmission apparatus when said address resolution request is for an IP address which is reachable by said third transmission apparatus.

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6. The OSI tunnel routing method as claimed in claim 1, further comprising the step of:  
said first transmission apparatus sending an OSI tunnel generation request to said second transmission apparatus when generating said OSI tunnel.

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7. The OSI tunnel routing method as  
claimed in claim 6, further comprising the step of:  
5        said second transmission apparatus  
receiving said OSI tunnel generation request,  
generating an OSI tunnel, and sending an OSI tunnel  
generation response to said first transmission  
10        apparatus.

8. The OSI tunnel routing method as  
15        claimed in claim 1, further comprising the step of:  
          said first transmission apparatus sending  
an OSI tunnel deletion request to said second  
transmission apparatus when said OSI tunnel is not  
20        used for a predetermined time.

9. The OSI tunnel routing method as  
25        claimed in claim 8, further comprising the step of:  
          said second transmission apparatus  
deleting said OSI tunnel when receiving said OSI  
tunnel deletion request, and sending an OSI tunnel  
deletion response to said first transmission  
30        apparatus.

10. A transmission apparatus which  
35        transmits an IP packet which is encapsulated in an  
OSI packet to another transmission apparatus in

which each of said transmission apparatus and said another transmission apparatus is connected to an IP network, and said transmission apparatus and said another transmission apparatus form an OSI network, said transmission apparatus comprising:

an OSI tunnel propagation part exchanging reachable IP network addresses and an own OSI network address on said OSI network;

an OSI tunnel table generating part generating an OSI tunnel table which includes said OSI network address and said reachable IP network addresses; and

an OSI tunnel generation part, when said transmission apparatus receives an request to access an IP address, determining a first transmission apparatus which can transfer data for said IP address by referring to said OSI tunnel table, and generating an OSI tunnel between said transmission apparatus and said first transmission apparatus.

11. The transmission apparatus as claimed in claim 10, further comprising:

an OSI tunnel deletion part deleting said OSI tunnel when said OSI tunnel is not used for a predetermined time.

12. The transmission apparatus as claimed in claim 10, further comprising:

an OSI tunnel switching part generating a new OSI tunnel by using an alternate route and switching said OSI tunnel to said new OSI tunnel

when a failure occurs in a route of said OSI tunnel.

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13. The transmission apparatus as claimed  
in claim 12, wherein said OSI tunnel switching part  
switches said new OSI tunnel back to said OSI tunnel  
when said route recovers from said failure within a  
10 predetermined time.

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14. The transmission apparatus as claimed  
in claim 10, further comprising:

an address resolution part receiving an  
address resolution request, and sending a MAC  
address of said transmission apparatus when said  
20 address resolution request is for an IP address  
which is reachable by said transmission apparatus.

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15. The transmission apparatus as claimed  
in claim 10, said OSI tunnel generation part  
comprising:

an OSI tunnel generation request part  
30 sending an OSI tunnel generation request to said  
first transmission apparatus.

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16. The transmission apparatus as claimed  
in claim 15, said OSI tunnel generation part further

comprising:

an OSI tunnel generation response part  
receiving said OSI tunnel generation request,  
generating an OSI tunnel, and sending an OSI tunnel  
5 generation response to an transmission apparatus  
which sent said OSI tunnel generation request.

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17. The transmission apparatus as claimed  
in claim 11, said OSI tunnel deletion part  
comprising:

an OSI tunnel deletion request part  
15 sending an OSI tunnel deletion request to an  
transmission apparatus on the other end of an OSI  
tunnel which is not used for a predetermined time.

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18. The transmission apparatus as claimed  
in claim 17, said OSI tunnel deletion part further  
comprising:

an OSI tunnel deletion response part  
25 deleting said OSI tunnel which is not used for a  
predetermined time when receiving said OSI tunnel  
deletion request, and sending an OSI tunnel deletion  
response to an transmission apparatus which sent  
30 said OSI tunnel deletion request.

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